**IN THE UNITED STATES PATENT & TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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| In re Application of: **CARBALLO ET AL.** | § | Attorney Docket No.:**AUS920030656US1** |
| Serial No.: **10/698,138** | § | Examiner: **PIERRE-LOUIS, ANDRE** |
| Filed: **10/30/2003** | § | Group Art Unit: **2123** |
| Title: **CUSTOMER CONTROLLED DESIGN OF A COMMUNCATION SYSTEM** | § | Confirmation No.: **3491** |

**APPEAL BRIEF UNDER 37 C.F.R. 1.192**

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Sir:

This Appeal Brief is submitted in support of the Appeal of the Examiner's final rejection of Claims 1-22 in the above-identified application.

## REAL PARTY IN INTEREST

The real party in interest in the present Appeal is International Business Machines Corporation, the Assignee of the present application.

## RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, the Appellants' legal representative, or assignee, which directly affect or would be directly affected by or have a bearing on the Board's decision in the pending Appeal.

## STATUS OF CLAIMS

Claims 1-22 were originally presented. In Amendment A filed February 19, 2007, no claims were entered or canceled, and Claims 1-4, 6-13 and 15-22 were amended. Claims 1-22, which comprise all pending claims, stand finally rejected by the Examiner as noted in the Final Office Action dated May 14, 2007. The rejection of each of Claims 1-22 is appealed.

## STATUS OF AMENDMENTS

Appellants' Amendment A, filed February 19, 2007, was entered by the Examiner. No amendments to the claims have been proposed or entered subsequent to the final rejection that led to this appeal.

## SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 recites a system for designing a communication link for use in a data processing system (see, e.g., Figure 5, element 401 and page 7, lines 1-7). The system includes a parameter generator configured to permit a user to specify a first set of parameters associated with the communication link and further configured to derive a set of internal parameters associated with the communication link from the first set of parameters (see, e.g., Figure 5, element 502 and page 8, lines 6-15). The system further includes an internal link model comprising a set of configurable link cells (see, e.g., Figure 6, element 504 and page 10, lines 8-11). The internal link model is configured to receive the derived set of internal parameters and to instantiate each link cell in the set of configurable link cells based on the set of internal parameters (see, e.g., Figure 6, element 504 and page 10, line 17 through page 11, line 8). In the manner permitted by 35 U.S.C. § 112, sixth paragraph, Claim 1 recites that the system includes

means for modeling a bit error rate (BER) of the communication link based upon the instantiated set of link cells (see, e.g., Figure 4, element 402 and page 11, line 13). Claim 1 further recites in the manner permitted by 35 U.S.C. § 112, sixth paragraph, that the system includes means for presenting at least one characteristic of the modeled communication link to the user (see, e.g., page 12, lines 1-5).

Independent Claim 10 recites a computer program product including a tangible computer readable medium and program code, within the computer readable medium, for designing a communication link for use in a data processing system. The program code includes parameter generator code for permitting a user to specify a first set of parameters associated with the communication link and further for deriving a set of internal parameters associated with the communication link from the first set of parameters (see, e.g., Figure 5, element 502 and page 8, lines 6-15). The program code further includes an internal link model code for modeling an internal link having a set of configurable link cells (see, e.g., Figure 6, element 504 and page 10, lines 8-11). The internal link model code is configured to receive the derived set of internal parameters and to instantiate each link cell in the set of configurable link cells based on the set of internal parameters (see, e.g., Figure 6, element 504 and page 10, line 17 through page 11, line 8). The program code further includes bit error rate (BER) modeling code for modeling a bit error rate (BER) of the instantiated set of configurable link cells (see, e.g., Figure 4, element 402 and page 11, line 13) and code for presenting at least one characteristic of the communication link to the user (see, e.g., page 12, lines 1-5).

Independent Claim 19 recites a method of providing a service permitting a user to define a communication link suitable for use in a data processing system. The method includes defining an internal model of a generic communication link comprising a set of configurable link cells (see, e.g., Figure 6, element 504 and page 10, lines 8-11). The method further includes enabling the user to specify a first set of parameters associated with the communication link while preventing the user from accessing the internal model (see, e.g., page 8, lines 6-15 and page 11, lines 17-31). The method further includes providing means for converting the first set of parameters to an internal set of parameters (see, e.g., Figure 5, element 502 and page 8, lines 6-15) and providing means for using the internal parameters to configure the internal model of the

communication link (see, e.g., Figure 6, element 504 and page 10, line 17 through page 11, line 8).

## GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The ground of rejection to be reviewed on appeal is the final rejection of Claims 1-22 under 35 U.S.C. § 103 as unpatentable over U.S. Patent No. 7,093,172 to *Fan et al.* (*Fan*) in view of Goldsmith, *Design and Performance of High-Speed Communication Systems over Time-Varying Radio Channels*, University of California at Berkeley, 1994 (hereinafter *Goldsmith*), which is set forth in paragraph 6 of the Final Office Action dated May 14, 2007.

## ARGUMENT

Claims 1-22 stand finally rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 7,093,172 to *Fan* in view of *Goldsmith*. That rejection is not well founded and should be reversed.

### I. Rejection of Independent Claims 1, 10 and 19 under 35 U.S.C. § 103

#### A. Rejection of independent Claims 1, 10 and 19 should be reversed because the Examiner's combination of *Fan* and *Goldsmith* is improper

In *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), the Court affirmed that the following factual inquiries first enunciated in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), remain the basis for determining obviousness under 35 U.S.C. § 103:

(1) Determining the scope and content of the prior art;

(2) Ascertaining the differences between the claimed invention and the prior art; and

(3) Resolving the level of ordinary skill in the pertinent art.

The *KSR* Court further held, "The combination of familiar elements according to known methods is *likely to be obvious when it does no more than yield predictable results*." (emphasis added) (discussing *United States v. Adams*, 383 U.S. 39, 40 (1966) (the companion case to *Graham*), *Anderson's Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969), and *Sakraida v. AG Pro, Inc.*, 425 U.S. 273 (1976)). Moreover, in evaluating the appropriateness of a combination of reference teachings, "a prior art reference must be considered in its entirety, i.e., as a whole"

(emphasis in original). MPEP 2141.02, citing W.*L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

As described in *Fan's* Abstract, *Fan*, taken as a whole, discloses a physical layer communication chip including a test packet generator that transmits test packets containing a pseudo random bit sequence via a closed communication path within the physical layer communication chip. The physical layer communication chip further includes a test packet checker that receives the test packets from the closed communication path and determines a bit error rate (BER) of the test packets therefrom. As illustrated in *Fan's* Figure 1, the physical layer communication chip interfaces a computer system 105 to an optical network 110.

In contrast, *Goldsmith*, taken as a whole, is directed to the "design and performance of high-speed communication systems over time-varying radio channel" (*Goldsmith*, Title) and, in particular, to spectrally efficient communication over time-varying radio channels in systems where estimates of channel parameters are fed back to the radio transmitter (*Goldsmith*, Abstract, page 1, lines 5-11). Thus, *Goldsmith* is directed to improving traditional mobile telephony systems that employ CDMA, FDMA and TDMA spectrum sharing techniques (*Goldsmith*, Abstract, page 2, lines 1-3).

Turning now to the record, Appellant notes that the Examiner has failed to provide any details regarding the resulting system arising from the proposed combination of *Fan* and *Goldsmith*. That is, the Examiner's statement of the rejection neglects to include what elements or method steps within *Goldsmith's* 196 pages of disclosure are to be combined with *Fan*, how any such elements or method steps could be combined with *Fan's* physical layer communication chip, and what method and/or system would result from the proposed combination. Consequently, the Examiner's proposed combination of *Fan* and *Goldsmith* lacks the requisite *predictability* to form the basis of an obviousness rejection.

The Examiner has further failed to make of record any objective findings of fact (whether from the references themselves, knowledge available in the art, common sense or any other source) that support the proposed combination of *Fan* and *Goldsmith*. The Examiner's citation in paragraph 6.1 of the Final Office Action to various advantages provided by the individual

references to their own respective different fields of endeavor (e.g., *Goldsmith's* RF spectral efficiency or *Fan's* improvement of transmission characteristics in an optical network) does not demonstrate that the features underlying such advantages would apply to the combined system of *Fan* and *Goldsmith* or would be capable of substitution into the combined system in place of other elements. Absent such findings of fact, the Examiner has failed to discharge his burden "to explain why the combination of the teachings is proper" (emphasis supplied). MPEP 2142, citing *Ex parte Skinner*, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1986).

Because the Examiner's proposed combination of references is not supported by any objective findings of fact and further is not explained by the Examiner such that Appellant is apprised of what combination of features the Examiner is relying upon in the rejection, it is evident that the Examiner's combination of *Fan* and *Goldsmith* is improper and that the Examiner has failed to establish a *prima facie* case of obviousness with respect to independent Claims 1, 10 and 19 and their respective dependent claims.

**B. Rejection of independent Claims 1 and 10 should be reversed because Examiner's combination of *Fan* and *Goldsmith* does not disclose each claimed feature**

**1. Rejection of independent Claims 1 and 10 should be reversed because combination of *Fan* and *Goldsmith* does not disclose claimed "parameter generator"**

Exemplary independent Claim 1 (and similarly Claim 10) is not rendered unpatentable by the combination of *Fan* and *Goldsmith* because that combination of references does not disclose each of the individual features nor the combination of features recited in exemplary Claim 1. For example, the combination of *Fan* and *Goldsmith* does not disclose the "parameter generator" set forth in exemplary Claim 1 as follows:

> a parameter generator configured to permit a user to specify a first set of parameters associated with the communication link and further configured to derive a set of internal parameters associated with the communication link from the first set of parameters.

With reference to the claimed "parameter generator", paragraphs 4.1 and 6.1 of the Final Office Action cite *Fan's* Pseudo Random Bit Stream (PRBS) generator (variously identified by reference numerals 225a, 425a and 525a in Figures 2, 4a and 5, respectively) and col. 7, line 27 through col. 8, line 64 of *Fan* as teaching the claimed "parameter generator." However, *Fan's* PRBS generator, which is described, for example, at col. 9, line 53 *et seq.* of *Fan*, merely generates a pseudo random bit stream (PRBS). *Fan*'s PRBS generator is not "configured to permit a user to specify a first set of parameters associated with the communication link and further configured to derive a set of internal parameters associated with the communication link from the first set of parameters," as explicitly set forth in exemplary Claim 1. That is, *Fan* (viewed in combination with *Goldsmith*) does not allow a human user to exercise judgment and control in selecting parameters for the communication link, and further, does not derive communication link parameters from such user-supplied parameters. Instead, *Fan* discloses that the physical layer device itself generate a random bit stream forming the contents of data packets. The Examiner's additional citation to col. 7, line 27 through col. 8, line 64 of *Fan* is inapposite, as the cited passage neither describes *Fan's* PRBS generator nor discloses any other component that is "configured to permit a user to specify a first set of parameters associated with the communication link and further configured to derive a set of internal parameters associated with the communication link from the first set of parameters," as recited in exemplary Claim 1.

In the Final Office Action, the Examiner does not rely upon any specific passage of *Goldsmith* as disclosing the claimed "parameter generator," but nevertheless refers to *Goldsmith* (by name only) in paragraph 4.1 of the Final Office Action as disclosing the claimed "parameter generator." While the contents of *Goldsmith* are reviewed and explained in detail *infra*, Appellant will here merely point out that the Examiner has been unable to identify any particular feature of *Goldsmith* that discloses the claimed "parameter generator" recited in exemplary Claim 1 and that *Goldsmith* does not allow a human user to exercise judgment and control in selecting parameters for the communication link, as claimed.

Because neither *Fan* nor *Goldsmith* individually, nor the combination of those references discloses the claimed "parameter generator", Appellant respectfully submits that the cited

combination of references does not render exemplary Claim 1, similar Claim 10 and their respective dependent claims unpatentable under 35 U.S.C. § 103.

**2. Rejection of independent Claims 1 and 10 should be reversed because Examiner's combination of *Fan* and *Goldsmith* does not disclose claimed "internal link model"**

The rejection of exemplary Claim 1 should also be reversed because the cited combination of *Fan* and *Goldsmith* does not disclose the "internal link model" set forth in Claim 1 as follows:

> an internal link model comprising a set of configurable link cells, wherein the internal link model is configured to receive the derived set of internal parameters and to instantiate each link cell in the set of configurable link cells based on the set of internal parameters.

With respect to the above feature of exemplary Claim 1, paragraphs 4.1 and 6.1 of the Final Office Action cite col. 7, lines 27 through col. 8, line 64 of *Fan*, and in particular, cite the single-chip multimode multi-sublayer PHY (physical layer device) shown at reference numeral 130 of *Fan's* Figures 1 and 3 as teaching the "internal link model" and cite send and receive interfaces 135a, 135b of single-chip multimode multi-sublayer PHY 130 as disclosing the internal link model "receiv[ing] the derived set of internal parameters."

A review of the cited portions of *Fan* reveals that *Fan*, when viewed in combination with *Goldsmith*, does not disclose that *Fan's* single-chip multimode multi-sublayer PHY is or contains an internal link model (i.e., a model of a communication link) as claimed. Further, the cited portions of *Fan* and the remainder of the reference do not disclose the claimed "set of configurable link cells" within the "internal link model" as claimed. Moreover, because the combination of *Fan* and *Goldsmith* does not disclose "deriv[ing] a set of internal parameters associated with the communication link from the first set of parameters" as discussed above, the cited portion of *Goldsmith* does not disclose an internal link model that "is configured to received the derived set of internal parameters and to instantiate each link cell ... based on the set of internal parameters" as claimed.

At most, the combination of *Fan* and *Goldsmith* discloses that *Fan's* single-chip multimode multi-sublayer PHY, which functions as a transceiver interposed between a computer and an optical network, is configurable to operate in multiple modes (e.g., utilizing 10 gigabit Ethernet, fibre channel or other protocols), as disclosed by *Fan* at col. 8, lines 43-53. However, the configurability of *Fan's* single-chip multimode multi-sublayer PHY does not somehow transform single-chip multimode multi-sublayer PHY into a model of a communication link as claimed.

Appellant also notes that, while the Examiner does not rely upon any specific passage of *Goldsmith* as disclosing the claimed "internal link model," the Examiner nevertheless refers to *Goldsmith* (by name only) in paragraph 4.1 of the Final Office Action as disclosing the claimed "internal link model." In response, Appellant will again here merely point out that the Examiner has not identified any feature with the 196 pages of *Goldsmith* that discloses the claimed "internal link model" recited in exemplary Claim 1.

Because neither *Fan* nor *Goldsmith* individually, nor the combination of those references discloses the claimed "internal link model", Appellant respectfully submits that the cited combination of references does not render exemplary Claim 1, similar Claim 10, and their respective dependent claims unpatentable under 35 U.S.C. § 103.

**C. Rejection of independent Claim 19 should be reversed because Examiner's combination of *Fan* and *Goldsmith* does not disclose each claimed feature**

**1. Rejection of independent Claim 19 should be reversed because combination of *Fan* and *Goldsmith* does not disclose the claimed "defining" step**

Independent Claim 19 is not rendered unpatentable by the combination of *Fan* and *Goldsmith* because that combination of references does not disclose each of the individual features nor the combination of features recited in exemplary Claim 19. For example, the combination of *Fan* and *Goldsmith* does not disclose the "defining" step set forth in exemplary Claim 19 as follows:

defining an internal model of a generic communication link, the internal model comprising a set of configurable link cells.

With reference to the above step, paragraph 6.10 of the Final Office Action cites Figures 1, 3 and 4 and col. 14, line 11 through col. 15, line 11 of *Fan* and pages 44-54 of *Goldsmith*.

Turning first to the cited portions of *Fan*, *Fan's* Figure 1 discloses a transceiver module including a single-chip multimode multi-sublayer PHY, and *Fan's* Figures 3 and 4a depict more detailed block diagrams of the single-chip multimode multi-sublayer PHY. *Fan's* col. 14, line 11 through col. 15, line 11 describes various components of the single-chip multimode multi-sublayer PHY, including a management and control block 370, a receiver block 340, and a clock and data recovery serializer 348. As noted above in the argument with respect to Claim 1, the cited portions of *Fan* reveals that *Fan*, when viewed in combination with *Goldsmith*, does not disclose that single-chip multimode multi-sublayer PHY defines an "internal model of a generic communication link" as claimed.

Referring now to *Goldsmith*, Appellant notes that Section 3.2 of *Goldsmith*, which begins on p. 44, discloses the use of a system model for an impulse response channel "to determine the optimal input spectrum for the time-varying impulse response channel." At page 46 *et seq.*, the optimal input spectrum is interpreted using a "water-filling analogy." Next, Section 3.3 of *Goldsmith* discloses a system model for use when "the transmitted signal is narrowband" (p. 47, paragraph 2). The narrowband signal model of Section 3.3 adapts transmit the power, data rate and coding scheme relative to channel variations (p. 50, paragraph 1). Page 50 of *Goldsmith* discloses "two policies which adapt only the transmit power to maintain a constant SNR at the receiver." Section 3.3.3 of *Goldsmith*, which spans pp. 51-53, provides numerical results for "the spectral efficiency and outage probability of the power control policies" described in the preceding sections. Finally, Section 3.4 of *Goldsmith*, which includes pp. 53-54, evaluates the "spectral efficiency of uncoded M-QAM modulation with ideal Nyquist data pulses."

After a detailed review of the cited portion of *Goldsmith*, Appellant respectfully submits that the cited portion of *Goldsmith* does not disclose the claimed step of "defining an internal model of a generic communication link, the internal model comprising a set of configurable link

cells." In particular, the system model for impulse response channels disclosed Figure 3.3 of Section 3.2 of *Goldsmith*, while illustrating a channel, does not disclose an internal model "comprising a set of configurable link cells" as claimed. Similarly, the system model for narrowband fading channels shown in Figure 3.8 of Section 3.3 of *Goldsmith*, while including a channel, does not disclose an internal model "comprising a set of configurable link cells" as claimed. Consequently, when *Goldsmith* is viewed together with *Fan*, that combination of references does not disclose the "defining" step of independent Claim 19 and therefore does not render Claim 19 and its dependent claims unpatentable under 35 U.S.C. § 103.

**2. Rejection of independent Claim 19 should be reversed because combination of *Fan* and *Goldsmith* does not disclose the claimed "enabling" step**

Independent Claim 19 is not rendered unpatentable by the combination of *Fan* and *Goldsmith* because that combination of references does not disclose the "enabling" step set forth in exemplary Claim 19 as follows:

> enabling the user to specify a first set of parameters associated with the communication link while preventing the user from accessing the internal model.

With reference to the above step, paragraph 6.10 of the Final Office Action again cites Figures 1, 3 and 4 and col. 14, line 11 through col. 15, line 11 of *Fan* and pages 44-54 of *Goldsmith* without any citation to a particular set of features believed by the Examiner to show the claimed "enabling" step.

As noted above, the cited portions of *Fan* disclose a transceiver module including a single-chip multimode multi-sublayer PHY having various components, including a management and control block 370, a receiver block 340, and a clock and data recovery serializer 348. When the cited portions of *Fan* are viewed in combination with *Goldsmith*, nothing in the combination of references discloses that *Fan's* single-chip multimode multi-sublayer PHY enables "the user to specify a first set of parameters associated with the communication link while preventing the user from accessing the internal model" as claimed.

The cited passage of *Goldsmith* is discussed in detail above. As noted *supra* the cited pages of *Goldsmith* disclose a system model for impulse response channels in Figure 3.3 of Section 3.2 and a system model for narrowband fading channels in Figure 3.8 of Section 3.3. Because the contents of *Goldsmith's* models are fully shown and described and therefore presumably accessible to any user of the models, nothing in *Goldsmith*, when viewed together with *Fan*, discloses "enabling the user to specify a first set of parameters associated with the communication link while preventing the user from accessing the internal model" (emphasis supplied) as claimed.

Because the combination of *Fan* and *Goldsmith* does not disclose the "enabling" step of independent Claim 19, Appellant respectfully submits that the combination of *Fan* and *Goldsmith* does not render Claim 19 and its dependent claims unpatentable under 35 U.S.C. § 103.

**3. Rejection of independent Claim 19 should be reversed because combination of *Fan* and *Goldsmith* does not disclose the "providing" steps of Claim 19**

Independent Claim 19 is also not rendered unpatentable by the combination of *Fan* and *Goldsmith* because that combination of references does not disclose the "providing" steps set forth in exemplary Claim 19 as follows:

> providing means for converting the first set of parameters to an internal set of parameters; and
> providing means for using the internal parameters to configure the internal model of the communication link.

With reference to the above steps, paragraph 6.10 of the Final Office Action again cites Figures 1, 3 and 4 and col. 14, line 11 through col. 15, line 11 of *Fan* and pages 44-54 of *Goldsmith* without any citation to a particular set of features believed by the Examiner to show the claimed "providing" steps.

As noted above, the cited portions of *Fan* disclose a transceiver module including a single-chip multimode multi-sublayer PHY having various components, including a management and control block 370, a receiver block 340, and a clock and data recovery serializer 348. When the cited portions of *Fan* are viewed in combination with *Goldsmith*, nothing in the combination of references discloses that *Fan's* single-chip multimode multi-sublayer PHY provides "means for converting the first set of parameters to an internal set of parameters" or provides "means for using the internal parameters to configure the internal model of the communication link" as claimed.

The cited passage of *Goldsmith* is discussed in detail above. As noted *supra* the cited pages of *Goldsmith* discloses a system model for impulse response channels in Figure 3.3 of Section 3.2 and a system model for narrowband fading channels in Figure 3.8 of Section 3.3. However, nothing in *Goldsmith*, when viewed together with *Fan*, discloses "providing means for converting the first set of parameters to an internal set of parameters" or "providing means for using the internal parameters to configure the internal model of the communication link" as claimed.

Because the combination of *Fan* and *Goldsmith* does not disclose the "providing" steps of independent Claim 19, Appellant respectfully submits that the combination of *Fan* and *Goldsmith* does not render Claim 19 and its dependent claims unpatentable under 35 U.S.C. § 103.

## II. Conclusion

The foregoing remarks demonstrate that the combination of cited references does not disclose each feature of Claims 1-22 as required to support a rejection under 35 U.S.C. § 103. Appellants therefore respectfully request the Board to reverse the rejection of each pending claim.

No additional fee is believed to be required. If, however, any additional fees are required, please charge those fees to IBM Corporation Deposit Account No. **09-0447**.

Respectfully submitted,

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## CLAIMS APPENDIX

1. A system for designing a communication link for use in a data processing system, said system comprising:

a parameter generator configured to permit a user to specify a first set of parameters associated with the communication link and further configured to derive a set of internal parameters associated with the communication link from the first set of parameters;

an internal link model comprising a set of configurable link cells, wherein the internal link model is configured to receive the derived set of internal parameters and to instantiate each link cell in the set of configurable link cells based on the set of internal parameters;

means for modeling a bit error rate (BER) of the communication link based upon the instantiated set of link cells; and

means for presenting at least one characteristic of the modeled communication link to the user.

2. The system of claim 1, further comprising an estimator configured to estimate the area and power consumption based on the user-specified first set of parameters.

3. The system of claim 1, wherein the means for modeling the BER includes:

a channel simulator configured to receive the instantiated set of configurable link cells from the parameter generator; and

a media transfer function specified by the user, wherein the media transfer function is indicative of a channel to which the instantiated set of configurable link cells is connected.

4. The system of claim 1, wherein the parameter generator prevents the user from directly accessing the set of internal parameters and the internal link model.

5. The system of claim 1, wherein the first set of parameters includes link design parameters selected from a set of parameters comprising a sampling complexity parameter, a loop bandwidth parameter, and a loop order parameter.

6. The system of claim 1, wherein the set of configurable link cells in the internal link model includes a sampling latch cell having a configurable sample rate and a sample memory having a configurable memory size.

7. The system of claim 6, wherein the set of configurable link cells in the internal link model further includes an edge detector, a phase controller, and a phase rotator, each having at least one configurable parameter.

8. The system of claim 1, wherein power supply voltage is a configurable parameter of the internal link model.

9. The system of claim 1, wherein the system is configured to permit the user to specify a first operational parameter and an acceptable limit for a second operational parameter, and to instantiate each link cell to obtain an optimal value for the first operational parameter constrained by the second operational parameter.

10. A computer program product comprising:

a tangible computer readable medium;

program code, within the computer readable medium, for designing a communication link for use in a data processing system, said program code including:

parameter generator code for permitting a user to specify a first set of parameters associated with the communication link and further for deriving a set of internal parameters associated with the communication link from the first set of parameters;

internal link model code for modeling an internal link comprising a set of configurable link cells, wherein the internal link model code is configured to receive the derived set of internal parameters and to instantiate each link cell in the set of configurable link cells based on the set of internal parameters;

bit error rate (BER) modeling code for modeling a bit error rate (BER) of the instantiated set of configurable link cells; and

code for presenting at least one characteristic of the communication link to the user.

11. The computer program product of claim 10, further comprising code for estimating the area and power consumption based on the user-specified first set of parameters.

12. The computer program product of claim 10, wherein the BER modeling code includes:

code for receiving the instantiated set of configurable link cells from the parameter generator; and

a media transfer function specified by the user, wherein the media transfer function is indicative of a channel to which the instantiated set of configurable link cells is connected.

13. The computer program product of claim 10, wherein the parameter generator code prevents the user from directly accessing the set of internal parameters and the model of the internal link.

14. The computer program product of claim 10, wherein the first set of parameters includes link design parameters selected from a set of parameters comprising a sampling complexity parameter, a loop bandwidth parameter, and a loop order parameter.

15. The computer program product of claim 10, wherein the set of configurable link cells in the internal link model includes a sampling latch cell having a configurable sample rate and a sample memory having a configurable memory size.

16. The computer program product of claim 15, wherein the set of configurable link cells in the internal link model further includes an edge detector, a phase controller, and a phase generator, each having at least one configurable parameter.

17. The computer program product of claim 10, wherein a power supply voltage is a configurable parameter of the internal link model.

18. The computer program product of claim 10, further comprising:

code for permitting the user to specify a first operational parameter of the communication link; and

code for determining values of the internal parameters to optimize the first operational parameter of the link constrained by the second operational parameter.

19. A method of providing a service permitting a user to define a communication link suitable for use in a data processing system, said method comprising:

defining an internal model of a generic communication link, the internal model comprising a set of configurable link cells;

enabling the user to specify a first set of parameters associated with the communication link while preventing the user from accessing the internal model;

providing means for converting the first set of parameters to an internal set of parameters; and

providing means for using the internal parameters to configure the internal model of the communication link.

20. The method of providing a service of claim 19, wherein:

enabling the user to specify a first set of parameters includes enabling the user to specify a first operational parameter and a second operational parameter;

providing means for using the internal parameters to configure the internal model includes providing means for configuring the internal model to obtain an optimal value for the first operational parameter constrained by the second operational parameter.

21. The method of providing a service of claim 19, further comprising providing means for simulating a bit error rate of the communication link.

22. The method of providing a service of claim 21, further comprising providing means for estimating die size and power consumption of the communication link.

## EVIDENCE APPENDIX

none

## RELATED PROCEEDINGS APPENDIX

none

## Validity of U.S. Pat. No. 6,322,445 Claim 1

**Claim 1:** A method of playing a multi-line poker game of cards having a game hand line and a plurality of bonus lines that are combined to create a game array having a plurality of paylines on a computer-based video gaming device, the method comprising:

determining a set of game parameters from a set of input signals from a player;

randomly dealing a plurality of cards from a deck of cards to fill the game hand line;

determining the cards from within the game hand that are to be held and cards that are to be discarded; } generic

randomly dealing cards from the deck of cards to replace all of the cards discarded from within the game hand;

**duplicating each card within the game hand and randomly placing the duplicated cards within the plurality of bonus lines until all of the locations within the game array are filled with cards;**

determining whether any of the paylines contain winning combinations of poker hands; and

determining an award amount for all winning combinations found within the paylines based upon the winning combination, the identity of the payline, and the amount of any wager placed on the payline containing the winning combination; } generic

**wherein the paylines comprise the game hand and the plurality of bonus lines.**

**Relevant Prior Art**

- Closest related prior art references (in descending order of relevance): U.S. Pat. Nos. 6,652,377 (Moody); 6,007,066 (Moody); 6,098,985 (Moody); 5,732,950 (Moody); 6,358,144 (Kadlic); 6,270,405 (Ferguson).

- 6,652,377 (Moody) "Electronic Video Slot and Poker Games"
    - electronic poker using card arrays (alt. emb. slots)
    - doesn't duplicate entire resolved game hand (i.e. held and replacement cards) - only duplicates "held" cards
    - no random placement of duplicates – placed in vertically aligned positions in non-game hand rows
    - FIG. 8 depicts v-shaped payline → payline doesn't coincide with game hand/bonus line alignment

- 6,007,066 (Moody) "Electronic Video Poker Game"
    - used in prior art rejections of claims 11-20 (cancelled by Applicant)

- electronic poker using card arrays
- one embodiment duplicates replacement cards only, alternate embodiment duplicates held cards only
- no random placement of duplicated cards – duplicates placed in vertically aligned positions
- one embodiment entire initially dealt game hand duplicated in other hands

- **6,085,985** (Moody) "Electronic Video Poker Game"
  - electronic poker using card arrays
  - only "held" cards from game hand duplicated
  - no random placement of duplicated cards
- **5,732,950** (Moody) "Electronic Video Poker Game"
  - electronic poker using card arrays
  - duplication of "stud" hand cards into replaced "draw" hand cards
  - no random placement of duplicated cards – vertically aligned shifting of cards between hands
- **6,358,144** (Kadlic) "Bonus Joker Poker"
  - electronic poker using multi-hand display – not formed in an "array"
  - after initial deal to multiple hands, n face up m face down, player selects one of the sets of n which is then duplicated to replace the other n card sets in the other hands, remaining face down cards then revealed and discard/replace sequence then commences for all hands
  - no duplication of game hand following discard/replace sequence
  - no random placement of duplicated cards
- **6,270,405** (Ferguson) "Casino Poker Game and Method"
  - electronic poker using multi-card arrays
  - "payline" may be different than game hand/bonus line alignment (FIGS. 4A-4C showing zig-zag paylines)
  - cards discarded from game hand randomly placed in other hands
  - no duplication of cards from game hand

**Analysis Summary**

All of the above except '405 disclose poker card arrays forming multiple hands and in which cards from the "game hand" are duplicated into other hands. The '377 and '066 patents (both to Moody) are the closest prior art relating to claim 1. The '377 patent discloses duplicating "held" cards which may be entire game hand if no cards discarded. The '066 patent discloses duplicating the entire initially dealt game hand.

None of the uncovered references disclosed or suggested duplicating a game hand that has been resolved through a discard/replace sequence as probably required by claim 1. Furthermore, none disclose or suggest randomly positioning the duplicated cards within the bonus lines. Therefore, claim 1 appears patentably valid over the prior art uncovered in the validity search.